

AMENDMENTS TO THE SPECIFICATION

Please amend the inventorship by removing Chunming Niu, whose invention is no longer being claimed.

Please replace paragraphs [0124] and [0132] with the following amended paragraphs. Applicants note that the amendments, which are formal in nature, do not introduce new matter.

[0124] In many applications (e.g., in photovoltaic devices, e.g., devices such as certain of those described in U.S. Patent Application No. 60/421,353, filed October 25, 2002, U.S. Provisional Patent Application No. 60/452,038, filed March 4, 2003, and U.S. Patent Application No. 10/656,802 (Attorney Docket No. 40-001320US), filed of even date herewith), at least one blocking layer is optionally used to restrict the movement of charges (e.g., to prevent the movement of electrons or holes in a particular direction, through a particular region of a device, or to a particular electrode). A blocking layer is a layer of some material either organic or inorganic, which has either: a high hole conductivity and high electron resistance to allow hole flow and prevent electron flow, or a high electron conductivity and high hole resistance to allow electron flow and prevent hole flow. Blocking layers can be incorporated e.g. onto either one or both sides of the active layer (e.g., a nanocomposite layer) of a photovoltaic device. For example, one or more blocking layers can be used to prevent a nanostructure photovoltaic cell from beginning to short out upon strong illumination and to assist in the creation of a high carrier density within nanostructures extending across the active layer. As another example, one or more blocking layers can be used to concentrate charges in an active region of a nanostructure-base LED to improve charge recombination within the nanocrystals.

[0132] When light absorbed by the nanostructures in a nanocomposite results in the formation of an electron-hole pair, the electron and hole can either recombine or remain

separated. Recombination of an electron and a hole results in luminescence (light emission). This phenomenon is useful in the creation of displays, LEDs, etc. comprising nanocomposites, particularly since the wavelength of light emitted can be controlled, for example, by choosing a nanostructure material having an appropriate band-gap. Recombination of electrons and holes is undesirable in other applications, however. In nanocomposites used in photovoltaic devices, for example, the electron and hole preferably do not recombine but rather travel to opposite electrodes. See also, e.g., U.S. Patent Application No. 60/421,353, filed October 25, 2002, U.S. Provisional Patent Application No. 60/452,038, filed March 4, 2003, and U.S. Patent Application No. 10/656,802 (Attorney Docket No. 40-001320US), filed of even date herewith. The present invention provides nanocomposite materials that support charge recombination and other materials that support charge separation.